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DRAFT STUDY PLAN
EXPANDED SITE INVESTIGATION
COOSA RIVER SITE
ROME, GEORGIA

Prepared Under
TDD No. F4-8707-16
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FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

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NUS CORPORATION
SUPERFUND DIVISION

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STUDY PLAN
EXPANDED SITE INVESTIGATION
COOSA RIVER SITE
ROME, GEORGIA
TDD NO. F4-8707-16

1.0 INTRODUCTION

The NUS Corporation Region IV Field Investigation Team (FIT) has been tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct an expanded site investigation (ESI) at the Coosa River site in Rome, Floyd County, Georgia. The investigation will be performed under the authority of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) of 1986. The task will be performed to satisfy the requirements stated in Technical Directive Document (TDD) No. F4-8707-16.

1.1 Objectives

The objectives of this ESI are to provide data which will support completion of an EPA Hazard Ranking System (HRS) documentation package, and, if the ESI data support additional work at the site, to expedite the Remedial Investigation/Feasibility Study (RI/FS) project planning. The ESI approach will aid the RI/FS planning phase by a) defining site problems, public health and environmental threats, and site features; b) identifying general response actions; c) formulating plans to collect any additional data required to characterize the source and site for the evaluation of potential remedial alternatives. These objectives will be accomplished through an evaluation of existing file material; the implementation of environmental and biological sampling programs; and an investigation of the nature of the wastes generated by industries in the site vicinity.

1.2 Scope of Work

The scope of this investigation will include the following:

Evaluation of Existing File Material

All existing file material will be examined to provide an accurate site history and to assist in the development of a sampling strategy.

Surface Water and Sediment Sampling

Surface water and sediment samples will be collected from the following locations:

- Unnamed tributaries to Little Dry Creek, up- and downstream from G.E. outfall Nos. 002 and 004.
- Unnamed tributary to Horseleg Creek, up- and downstream from G.E. outfall Nos. 001 and 003.
- Oostanaula River, up- and downstream from the confluence with Little Dry Creek.
- Etowah River, upstream from the confluence of the Etowah and Oostanaula Rivers.
- Coosa River, from the confluence of the Etowah and Oostanaula Rivers to downstream from the Rome Wastewater Treatment Plant.

Biological Sampling

Under the direction of U.S. EPA's Environmental Services Division, fish will be collected from the study area described above and analyzed for the presence of PCBs.

Industry Survey

A survey of industries which have in the past or currently discharge wastewater into the Oostanaula and Etowah Rivers upstream of the study area will be made to identify other possible sources of PCB contamination.

1.3 Methodology

All sample collection, sample preservation, and chain-of-custody procedures used during this investigation will be in accordance with the standard operation procedures as specified in Section 3 and 4 of the Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division, April 1, 1986. For details see Appendix A.

All laboratory analyses and laboratory quality assurance procedures used during this investigation will be in accordance with standard procedures and protocols as specified in the Analytical Support Branch Operations and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division; revised June 1, 1985 or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the contract analytical laboratory program.

1.4 Schedule

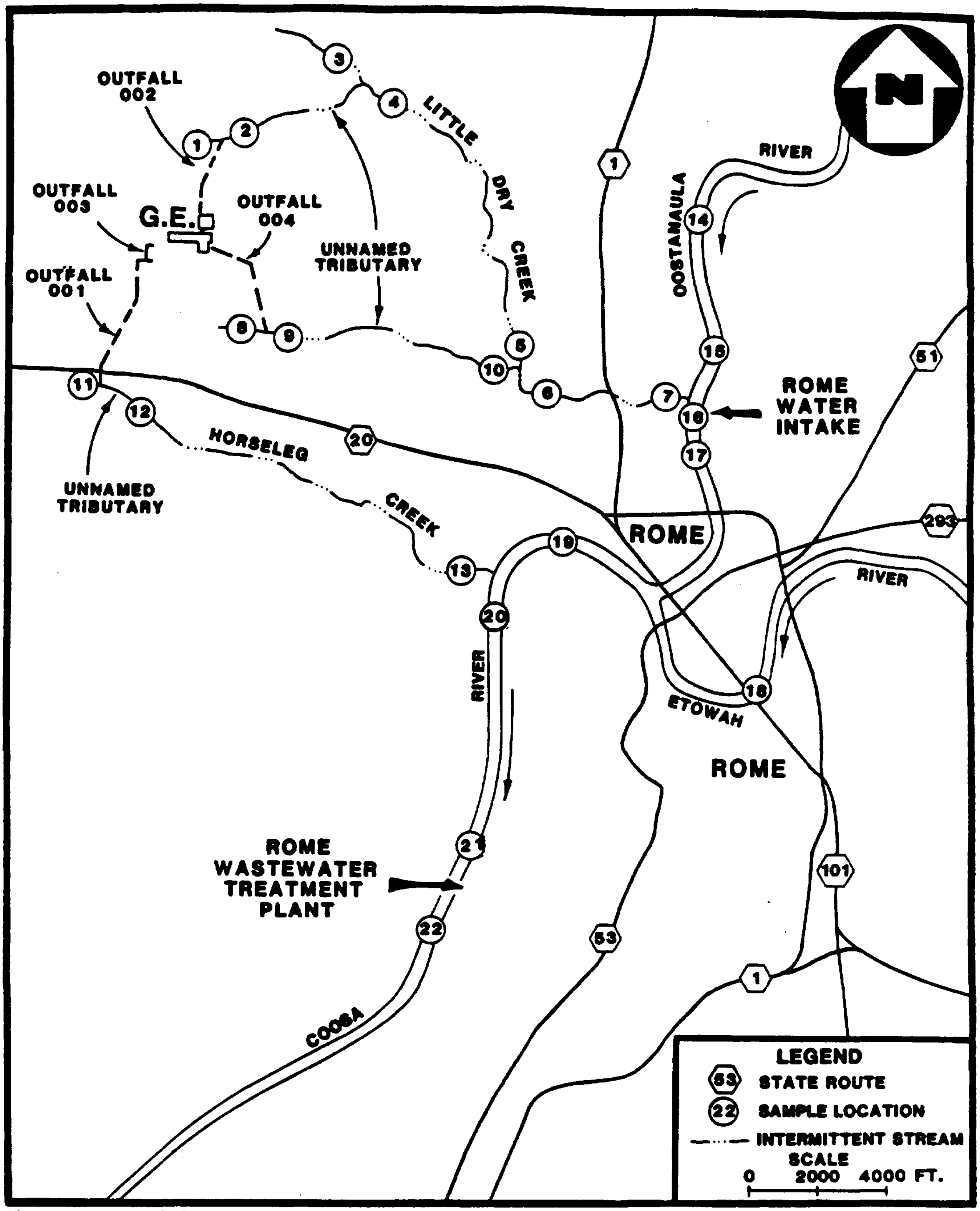
To be determined.

1.5 Personnel

Michael Profit, Project Manager.
David Upthegrove, Project Geologist
Other FIT Personnel, as needed.

1.6 Permits and Authorization Requirements

It will be the responsibility of the EPA to obtain all permits necessary to conduct the study along with authorization for site access and permission to take photographs onsite. The EPA will need to obtain the following permits and/or written authorization from the agencies or parties described below:



SAMPLE LOCATION MAP
COOSA RIVER SITE
ROME, GEORGIA

FIGURE 1

NUS CORPORATION
A Halliburton Company

Agency/Party	Permit/Authorization
General Electric Company Medium Transformer Department 1935 Redmond Circle Rome, Georgia 30161	Authorization to collect samples near outfall Nos. 001, 002, 003 and 004.
Property owners along the unnamed tributaries to Little Dry and Horseleg Creeks	Permission to cross property to collect samples from Little Dry and Horseleg Creeks.
Rome Water Department	Authorization to collect raw and finished water samples.

1.7 Deliverables

Major investigation-derived documents will be submitted to EPA as the study progresses. In addition to the study plan, major deliverables anticipated include the following:

- A map of the study area
- Results of laboratory analyses
- Photodocumentation of field activities
- Draft and Final reports

1.8 Site Description

The Coosa River study area is defined as those portions of the Coosa and Oostanaula Rivers and their tributaries which may have received PCB-contaminated stormwater runoff from the G.E. Medium Transformer Plant in Rome, Georgia. Specifically, this includes the areas up- and downstream from G.E. stormwater outfall Nos. 002 and 004 discharging to unnamed tributaries to Little Dry Creek; the area up- and downstream from outfall Nos. 001 and 003 discharging to an unnamed tributary to Horseleg Creek; the Oostanaula River upstream from the confluence with Little Dry Creek; the Etowah River upstream from the confluence of the Etowah and Oostanaula Rivers; and the Coosa River from the confluence of the Etowah and Oostanaula Rivers to downstream from the Rome Wastewater Treatment Plant (See Figure 1). This study area was chosen to evaluate the water quality in receiving streams potentially affected by discharges from the G. E. plant and to determine whether other sources of PCB contamination may exist.

1.9 Site History

G.E. manufactured electrical transformers filled with pyranol (a mixture of 40-65% Aroclor 1254 (PCB-1254)) at its Rome plant beginning in 1952 and ceased sometime prior to June 30, 1977. During that time, it is alleged that PCBs spilled on portions of the 67 acre site resulting in discharges of PCBs to unnamed tributaries to Little Dry and Horseleg Creeks and ultimately to the Oostanaula and Coosa Rivers.

In March 1976, EPA Headquarters directed the Regions to modify existing National Pollution Discharge Elimination System (NPDES) permits for manufacturers of transformers or capacitors so that PCB discharges would be eliminated as expeditiously as possible; final limitations set at a level near the detection limit (1 ppb) were to be achieved by July 1, 1977. The major events in the regulatory history of the G. E. Medium Transformer Plant (G.E.) aimed at achieving this goal are presented below.

- March 7, 1977. The Georgia Environmental Protection Division (EPD) issued NPDES permit No. GA0024155 covering the period through October 30, 1981. The permit limited discharges of PCBs to the unnamed tributaries of Horseleg and Little Dry Creeks during dry weather conditions to zero and during wet weather conditions (not defined) to below detection limits (BDL) which were defined as 10 ppb. Discharges to the Rome Wastewater Treatment Plant were limited to BDL (defined as 1 ppb).

- March 10, 1977. G.E. contested the NPDES permit, claiming that the new effluent standards for PCBs under Section 307(a) of the Federal Water Pollution Control Act were not applicable because the plant would cease manufacturing transformers containing PCBs on or before June 30, 1977.

- September 28, 1977. G.E. agreed to provide $506,082 to the City of Rome to resolve a continuing problem with PCB contaminated sludge at the Rome Wastewater Treatment Plant. The agreement was made without an admission of legal responsibility by G.E.

- October 7, 1977. G.E. and the Georgia EPD signed consent Order No. EPD-WQ-370 to resolve the objections G.E. cited in its NPDES permit. The order established a compliance schedule to limit discharges of PCBs to the levels cited in its NPDES permit by June 1979.

- November 14, 1978. Citing "significant progress in achieving compliance with the effluent limits set forth in Consent Order No. EPA-WQ-370," Consent Order No. EPD-WQ-406 was signed extending the compliance schedule to achieve acceptable PCB limits to July 1979; August 1979 was set as the deadline to evaluate the compliance schedule and modify permits as necessary.

- July 18, 1979. Citing "significant progress in achieving compliance with the effluent limits set forth in Order No. EPD-WQ-370," Consent Order No. EPD-WQ-416 was signed. This order established a new compliance schedule which incorporated the installation of a chemical/physical treatment system to limit PCB discharges. The system was to be fully operational by October 1, 1982.

- August 31, 1981. Citing "significant progress in achieving compliance with the effluent limits set forth in Order No. EPD-WQ-370," Consent Order No. EPD-WQ-487 was signed. Order No. EPD-WQ-487 modified the previous order by extending, until October 1, 1984, the date the treatment system was to be operational.

- December 30, 1982. Georgia EPD reissued NPDES permit No. GA0024155. This permit, which expires December 5, 1987, restated the original limits on PCB discharges and set July 1, 1983 as the date when final effluent limitations were to be attained.

- January 4, 1984. Citing "significant progress in achieving compliance with the effluent limits set forth in Consent Order No. EPD-WQ-370," Consent Order No. EPD-WQ-751 was signed, setting August 1, 1987 as the date to modify permit limits or the compliance schedule stated in the previous order.

- June 1984. PCBs were detected in fish taken from the Coosa River at concentrations ranging from 0 to 15 ppm in bottom fish and 0 to near 0 in sport fish such as bass. The FDA limit for interstate commerce is 2 ppm.

- October 24, 1985. EPA reviewed company-reported discharges from outfall Nos. 001-005 for the period of July 1, 1984 to June 30, 1985. Thirteen of 41 stormwater discharges exceeded the 10 ppb limit; 240 of 365 discharges to the sanitary sewer system (outfall No. 005) exceeded the 1 ppb limit.

- August 6, 1986. Georgia EPD submitted to EPA for comment a draft NPDES permit containing "final, enforceable limitations". The draft permit called for increasing the allowable levels of PCBs discharged from stormwater outfall Nos. 001-004 and eliminating limitations on discharges to the City of Rome sanitary sewer because the city has an "approved pretreatment program that limits G.E.'s discharge."

- September 17, 1986. EPA conducted a site inspection at the G.E. facility and concluded that the addition of a carbon absorption system would probably reduce effluent discharges to the allowable 1 ppb level. It was also concluded that it was unreasonable to relax current permit requirements.

- November 25, 1986. Georgia EPD submitted to EPA a draft Consent Order incorporating conclusions drawn from EPA's September 17, 1986 site inspection.

- December 5, 1986. EPA's Regional Counsel concluded that the draft Consent Order did not constitute timely and appropriate enforcement. A court sanctioned schedule to achieve compliance was recommended.

- January 5, 1987. EPA responded to the draft Consent Order offering no major objections.

- March 25, 1987. G.E. presented to Georgia EPD a proposed work plan for a PCB abatement study. The plan called for engineering and pilot plant testing to further reduce PCB effluent levels from each discharge stream.

- May 4, 1987. Citing "significant progress in approaching the effluent limits of 10 ppb as set forth in Order No. EPD-WQ-370," Consent Order No. EPD-WQ-1188 was signed. This order called for (1) more frequent cleaning of the oil/water separators on discharge points 001 and 003, (2) completion of an engineering/pilot plant study using granular activated carbon to evaluate the feasibility of achieving a PCB effluent discharge approaching 1 ppb from discharge points 001-005, and (3) selection of a course of action prior to December 1, 1987.

2.0 REGIONAL GEOLOGY AND HYDROLOGY

The Coosa River site is located in the Valley and Ridge physiographic province of northwest Georgia. This province is distinguished by folded and faulted stratified rocks of the Paleozoic era (Ref. No. 1 and 2). The study area lies within a valley whose elevation ranges from 575 to 700 feet above mean sea level. The area has a mild climate with an average January temperature of 43oF and an average July temperature of 80oF. The average annual precipitation is about 53 inches and includes only a small amount of snow. Rainfall is heaviest in winter and mid-summer and lightest in autumn (Ref. No. 1).

Except on ridges and steep slopes, groundwater is available in quantities sufficient for domestic and farm supplies throughout the study area. Groundwater occupies joints, fractures and solution openings in bedrock and pore spaces in the overlying soil. Recharge of water-bearing formations is by localized precipitation and enters the rock through the soil or through openings in outcropping bedrock.

The amount of water that a formation can release to a well depends on three major variables: type of rock in which the well is completed, depth of the formation below land surface, and local topography. Wells completed in shales tend to exhibit low yields (less than 10 gallons per minute), while sandstones may yield 20, 50, or rarely 200 gpm to wells. Carbonates, which include limestones and dolomites, are capable of yielding large quantities of water (up to 3500 gpm). Fractures generally become fewer, smaller, and more poorly connected with depth. Most water-bearing fractures in carbonates occur at depths above 350 feet; in sandstones and shales they generally occur at less than 250 feet. Wells in broad low areas and on gentle slopes yield more water than those located on ridges and steep slopes (Ref. No. 3). The major aquifers in the study area are the Floyd shale, the limestones of the Conasauga Formation, and the Knox dolomites. Wells in the vicinity range in depth from 50 to 350 feet below land surface (bls), with an average depth of about 115 bls. Yields vary from 6 gpm to 50 gpm, with an average yield of 15 gpm.

All surface waters contained in the study area (see site description) lie within the Mobile River Basin. This area is also referred to as the Alabama Subregion of the South Atlantic-Gulf Region (Ref. No. 4). Surface water in this subregion originates in the Blue Ridge physiographic province and flows southwesterly into Alabama. The area drained by the Coosa River and its tributaries to the Mayo Bar Dam southwest of Rome has been calculated at 4040 square miles (Ref. No. 5).

Since the Coosa and Oostanaula Rivers and their tributaries may have been conduits for PCB-laden stormwater runoff from the G.E. plant, surface water/sediment contamination is the major concern of the investigation. Although rural residences and farms rely primarily on water derived from wells and springs, the City of Rome relies exclusively on water drawn from intakes on the Oostanaula and Etowah Rivers. Little Dry Creek, which receives runoff from two unnamed tributaries on which stormwater outfall Nos. 002 and 004 are situated, flows into the Oostanaula River just downstream from the primary intake of the City of Rome municipal water sytem. (A secondary, backup intake is located downstream of the confluence of the Little Dry Creek and the Oostanaula River). Horseleg Creek, which receives runoff from stormwater outfall Nos. 001 and 003, empties into the Coosa River approximately one mile downstream from the confluence of the Oostanaula and Etowah Rivers.

Surface water recharge in the area occurs primarily through precipitation and runoff. Average annual runoff in the study areea is 20 - 25 inches. In dry periods, the base flow of streams is maintained by groundwater discharge and springs. Since many of the streams are actively down-cutting, bedrock is normally covered by only a few feet of alluvium (Ref. No. 3).

3.0 SAMPLING INVESTIGATION

The sampling phase of this investigation will involve the collection and analysis of both biological and environmental samples. The biological survey will be directed by EPA's Environmental Services Division which will be responsible for the preparation of the site-specific Standard Operating Procedures. The survey will involve the collection and chemical analysis of fish for the presence of PCBs.

The environmental sampling program will consist of the collection of surface water and sediment samples from the study area described in Section 1.8. Specific elements of the investigation are described below.

3.1 Sediment Sampling

Approximately 22 sediment samples will be collected using a Ponar dredge from the locations described in Table 1 and shown in Figure 1.

All samples will be analyzed for the presence of PCBs; seven samples will be analyzed for the Hazardous Substance List (HSL) parameters.

TABLE 1

SAMPLE DESCRIPTIONS
COOSA RIVER SITE
ROME, GEORGIA

Code	Medium	Location; Purpose
CR-SW /SD-01	Water/Sediment	Unnamed tributary No. 1 to Little Dry Creek, upstream from outfall No. 002; Establish background conditions.
CR-SW/SD-02	Water/Sediment	Unnamed tributary No. 1 to Little Dry Creek, downstream from outfall No. 002; Determine presence or absence of contaminants.
CR-SW/SD-03	Water/Sediment	Little Dry Creek, upstream from confluence with unnamed tributary No. 1; Establish background conditions.
CR-SW/SD-04	Water/Sediment	Little Dry Creek, downstream from confluence with unnamed tributary No. 1; Determine presence or absence of contaminants.
CR-SW/SD-05	Water/Sediment	Little Dry Creek, upstream from confluence with unnamed tributary No. 2; Determine the presence or absence of contaminants.
CR-SW/SD-06	Water/Sediment	Little Dry Creek, downstream from confluence with unnamed tributary No. 2; Determine the presence or absence of contaminants.
CR-SW/SD-07	Water/Sediment	Little Dry Creek, upstream from the confluence with Oostanaula River; Determine the presence or absence of contaminants.
CR-SW/SD-08	Water/Sediment	Unnamed tributary No. 2 to Little Dry Creek, upstream from outfall No. 004; Determine background conditions
CR-SW/SD-09	Water/Sediment	Unnamed tributary to Little Dry Creek No. 2, downstream from outfall No. 004; Determine the presence or absence of contaminants.

TABLE 1

SAMPLE DESCRIPTIONS
COOSA RIVER SITE
ROME, GEORGIA

Code	Medium	Location; Purpose
CR-SW/SD-10	Water/Sediment	Unnamed tributary No. 2 upstream from confluence with Little Dry Creek; Determine the presence or absence of contaminants.
CR-SW/SD-11	Water/Sediment	Unnamed tributary to Horseleg Creek, upstream from outfall Nos. 001 and 003; Determine background conditions.
CR-SW/SD-12	Water/Sediment	Unnamed tributary to Horseleg Creek, downstream from outfall Nos. 001 and 003; Determine the presence or absence of contaminants.
CR-SW/SD-13	Water/Sediment	Horseleg Creek, upstream from confluence with Coosa River; Determine the presence or absence of contaminants.
CR-SW/SD-14	Water/Sediment	Oostanaula River, upstream from former Celanese plant; Establish background conditions.
CR-SW/SD-15	Water/Sediment	Oostanaula River, upstream from confluence with Little Dry Creek; Determine the presence or absence of contaminants.
CR-SW/SD-16	Water/Sediment	Sediment sample will be collected from Oostanaula River, opposite Rome Water Intake. Water sample will be collected at the water intake prior to treatment; Determine the presence or absence of contaminants.
CR-SW-16A	Water	Finished water sample from Rome Water Intake; Determine the presence or absence of contaminants.
CR-SW/SD-17	Water/Sediment	Oostanaula River, downstream from confluence with Little Dry Creek; Determine the presence or absence of contaminants.

TABLE 1

SAMPLE DESCRIPTIONS
COOSA RIVER SITE
ROME, GEORGIA

Code	Medium	Location; Purpose
CR-SW/SD-18	Water/Sediment	Etowah River, upstream from confluence with Oostanaula River; Determine conditions on the Etowah upstream team the study area.
CR-SW/SD-19	Water/Sediment	Coosa River, upstream from confluence with Horseleg Creek; Determine the presence or absence of contaminants.
CR-SW/SD-20	Water/Sediment	Coosa River, downstream from confluence with Horseleg Creek; Determine the presence or absence of contaminants.
CR-SW/SD-21	Water/Sediment	Coosa River upstream from Rome Wastewater Treatment Plant; Determine the presence or absence of contaminants.
CR-SW/SD-22	Water/Sediment	Coosa River, downstream from Rome Wastewater Treatment Plant; Determine the presence or absence of contaminants.

3.1.1 Analytical and Container Requirements for Sediment Samples

Analyses	Container	Preservative
Extractable Organics (includes PCBs)	8 oz, glass*	Iced to 4oC
Volatile Organics	4 oz, glass*	Iced to 4oC
Inorganics	8 oz, glass	Iced to 4oC

* Sample container lids lined with teflon.

3.1.2 Estimated Cost of Contract Laboratory Analyses for sediment samples

Type of Analyses	Unit Cost	No. of Samples*	Analytical Cost
(HSL) Organics	$1,000.00	9	$ 9,000.00
(HSL) Inorganics	$ 250.00	9	$ 2,250.00
PCBs only	$ 250.00	15	$ 3,750.00
Estimated Cost of Analyses			$15,000.00

* Numbers include blanks, spikes, and quality control samples.

3.2 Surface Water

Surface water samples will be taken at the same general locations as the sediment samples described in Table 1 and shown in Figure 1. The samples will be grab samples, collected at mid-depth using a Nansen (or equivalent) sampler. In addition, raw water and finished water samples will be collected at the Rome Water intake on the Oostanaula River.

All water samples will be analyzed for the presence of PCBs. Seven of the samples will be analyzed for the HSL parameters..

3.2.1 Analytical and Container Requirements for Surface Water Samples

Analyses	Container	Preservative
Extractable Organics (includes PCBs)	2-1 gal, glass*	Iced to 4oC
Volatile Organics	2-40 ml, glass vial*	4 drops conc. HCl to pH<2; Iced to 4oC
Cyanide	1 liter, polyethylene plastic	NaOH to pH>12; Iced to 4oC
Metals	1 liter, polyethylene plastic	50% HNO_3 to pH<2; Iced to 4oC

* Sample container lids lined with teflon.

3.2.2 Estimated Cost of Contract Laboratory Analyses for Surface Water Samples

Type of analyses	Unit Cost	No. of Samples*	Analytical Cost
(HSL) Organics	$1,000.00	10	$ 10,000.00
(HSL) Inorganics	$ 250.00	10	$ 2,500.00
PCBs only	$ 250.00	15	$ 3,750.00
Estimated Cost of Analyses			$16,250.00

* Numbers include blanks, spikes, and quality control samples.

APPENDIX A
METHODOLOGY AND STANDARD OPERATING PROCEDURES

General

All sample collection, sample preservation, and chain-of-custody procedures used during this investigation will be in accordance with the standard operation procedures as specified in Section 3 and 4 of the Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division, April 1, 1986.

All laboratory analyses and laboratory quality assurance procedures used during this investigation will be in accordance with standard procedures and protocols as specified in the Analytical Support Branch Operations and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division; revised June 1, 1985 or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the contract analytical laboratory program.

Detailed Procedures for Surface Water and Sediment Sample Collection

The following procedures shall be used for the collection of surface water and sediment samples.

1. Water samples will be collected from mid-depth using a Nansen (or equivalent) sampler.

2. Sediment samples will be collected from the same vicinity as the corresponding water sample. Samples will be collected using a Ponar dredge.

3. Field parameters, including pH, conductivity, and temperature, will be measured for all the water samples.

4. Appropriate preservatives will be added to the water samples. The pH of the sample will be measured after preservation to ensure that enough preservative was added to significantly lower or raise the pH.

5. Sample containers will be sealed with electrical tape and affixed with sample numbers, sample tags, and custody seals. The sample containers will be sealed in plastic bags. Samples will be used after collection.

6. A Receipt For Sample Form will be signed by the property owner denoting acceptance or denial of duplicate samples, if appropriate. One copy will remain with the property owner.

Detailed Procedures for Field Cleaning of Teflon, Glass, Stainless Steel or Metal Equipment Used to Collect Samples for Organic Compounds and Trace Metal Analyses

1. Clean with tap water and laboratory detergent using a brush if necessary to remove particulate matter and surface film.

2. Rinse thoroughly with tap water.

3. Rinse thoroughly with organic-free water.

4. Rinse twice with pesticide-grade isopropyl alcohol.

5. Rinse thoroughly with organic-free water and allow to air dry as long as possible.

6. If organic -free water is not available, allow equipment to air dry as long as possible. Do <u>not</u> rinse with deionized or distilled water.

7. Wrap completely with aluminum foil to prevent contamination if equipment is to be stored or transported.

8. When equipment used to collect samples is cleaned in the field, a quality control sample will be collected. Organic -free water will be poured over the clean equipment and collected in the appropriate containers for analysis.

Operation of the decontamination area will be at the direction of the NUS representative in accordance with the site Health and Safety Plan.

References

1. Cressler, C. W., 1970, Geology and groundwater resources of Floyd and Polk Counties, Georgia: Georgia Geol. Survey Inf. Circ. 39, 95p.

2. Butts, Charles, and Gildersleeve, Benjamin, 1948, Geology and mineral resources of the Paleozoic area in northwest Georgia: Georgia Geol. Survey Bull. 54, p. 3-79.

3. Cressler, C. W., and others, 1976, Availability of water supplies in northwest Georgia: Georgia Geol. Survey Bull. 91, 140p.

4. Carter, R. F., and Hopkins, E. H., Georgia surface-water resources: U.S. Geol. Survey Water-Supply Paper 2300, p. 195-200.

5. Carter, R. F., 1959, Drainage area data for Georgia streams: U.S. Geol. Survey open-file report, 252p.